DOE F 1325.8
(8-89)
EFG (07-90)

United States Government **Department of Energy**

Memorandum

DATE DEC 1 0 2008

REPLY TO ATTN OF: EM-63 (Dr. James M. Shuler, 301-903-5513)

SUBJECT: Revision 14, DOE Certificate of Compliance No. 9132, T-3

TO Ronald J. Lutha, Site Manager Argonne Site Office

Attached are Revision 14 of DOE Certificate of Compliance (CoC) USA/9132/B(M)F (DOE) for the T-3 packaging and the Approval Record. The expiration date for this revision is December 31, 2013. This CoC is a renewal with no change to contents or design. As requested by your letter of November 20, 2008, the ownership of this CoC was changed from DOE Richland Operations Office to the DOE Argonne Site Office.

If you have any questions, please call Dr. James M. Shuler at (301) 903-5513.

Sincerely,

Dae Y. Chung
Headquarters Certifying Official
Deputy Assistant Secretary
Office of Safety Management and Operations
Office of Environmental Management

Attachments

cc: w/att.:
James Shuler, EM-63
Stephen O'Connor, EM-63
Katrina Panek, ASO
Anatanas Bindokas, SC-CH
Richard Self, RL
J. McGhee, ANL

(5-85)
(Formerly EV-618)

U.S. DEPARTMENT OF ENERGY
CERTIFICATE OF COMPLIANCE
For Radioactive Materials Packages

OMB Approval
No. 1910-2000

1a. Certificate Number	1b. Revision No.	1c. Package Identification No.	1d. Page No.	1e. Total No. Pages
9132	14	USA/9132/B(M)F (DOE)	1	7

2. PREAMBLE

2a. This certificate is issued under the authority of 49 CFR Part 173.7(d)

2b. The packaging and contents described in Item 5 below meet the safety standards set forth in subpart E, "Package Approval Standards" and subpart F, "Package and Special Form Tests" Title 10, Code of Federal Regulations, Part 71.

2c This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. This certificate is issued on the basis of a safety analysis report of the package design or application —

(1) Prepared by (*Name and Address*):	(2) Title and identification of report or application:	(3) Date:
U.S. Department of Energy Argonne Site Office 9800 South Cass Avenue Argonne, Illinois 60439	Westinghouse Hanford Company Consolidated Safety Analysis Report for the T-3 Spent Fuel Shipping Cask, Revision 6a; Addendum to T-3 SARP [see 5(e)]	August 1990

4. CONDITIONS
This certificate is conditional upon fulfilling of the applicable Operational and Quality Assurance requirements of 49CFR parts 100 – 199 and 10CFR Part 71 and the conditions specified in Item 5 below.

5 Description of Packaging and Authorized Contents, Model Number Criticality Safety Index, other Conditions, and References

(a) Packaging

(1) Model Number: T-3

(2) Description

A stainless steel and lead shielded irradiated fuel shipping package (cask). The cask is a right circular cylinder with upper and lower steel-encased rigid polyurethane foam (0.32 g/cm^3, 20 lb/ft^3) impact limiters. The overall dimensions are 541.5 cm (213.2 in.) in length and 132.1 cm (52 in.) in diameter. The cask without the impact limiters measures 450.1 cm (177.2 in.) in length and 67.16 cm (26.44 in.) in diameter.

The outer cask shell is comprised of a 2.54-cm (1-in.) thick stainless steel shell overlayed with a 10-gauge stainless steel cover. Between these two materials is a 0.2-cm (0.08-in.) diameter wire wrap, providing an air gap for additional thermal protection.

6a. Date of Issuance: DEC 1 0 2008	6b. Expiration Date: December 31, 2013

FOR THE U.S. DEPARTMENT OF ENERGY

7a. Address (*of DOE Issuing Office*):	7b. Signature, Name, and Title (*of DOE Approving Official*):
U.S. Department of Energy Safety Management and Operations, EM-60 1000 Independence Avenue, SW Washington, DC 20585	Dae Y. Chung Headquarters Certifying Official Deputy Assistant Secretary, Office of Safety Management and Operations Office of Environmental Management

The inner shell (containment vessel) is a standard seamless stainless steel Schedule 40 pipe having an outside diameter of 21.9 cm (8.625 in.) with a nominal wall thickness of 0.82 cm (0.322in.). The annular space between the inner and outer shells is filled with lead having a thickness of approximately 20.3 cm (8 in.).

Both the inner and outer shells are welded at each end to heavy steel closure plates with conical surfaces to assist in positioning and sealing. The containment vessel measures 373.4 cm (147 in.) in length by 20.27 cm (7.981 in.) in diameter.

The containment vessel is sealed at the bottom end with a 30.05-cm (11.83-in.) thick stainless steel plug with two Viton O-ring seals. The top end of the containment vessel is sealed with a 29.53-cm (11.625-in.) thick stainless steel plug with two Viton O-ring seals. The bottom plug is retained by a closure plate secured by eight, 1/2-13UNC x 2 ASTM A320, Grade L43 hex socket head cap screws. The top plug is secured in place utilizing 16, 1/2-13UNC x 2 ASTM A320, Grade L43 hex flange screws.

No drain or vents penetrate directly into the containment vessel. A drain/vent line opens directly into the area between the two O-ring seals at each end of the cask (end plugs). During shipment, the lines are sealed with Viton O-ring sealed threaded fasteners.

The cask is provided with six trunnions, four spaced 90 degrees apart at the top end and two spaced 180 degrees apart at the bottom end of the cask. The cask is tied down at the forward and aft ends by means of a cradle and yoke assembly. The gross weight of the cask and contents is 17,364 kg (38,200 lbs).

(3) Drawings

The packaging is constructed in accordance with Energy Research and Development Administration (ERDA) Drawing No. H-4-66230, Sheets 1, 3, 5, and 6, Revision No. 0, and Sheets 2 and 4, Revision No. 1. The T-3/6CVL Independent Fuel Canister is constructed in accordance with SRNL Drawing Nos.: R-R1-A-00035, Rev.3; R-R3-A-0028, Rev.2; R-R4-A-00040, Rev.3; R-R4-A-00041, Rev.3: R-R4-A-00042, Rev.1; and R-R4-A-00043, Rev.2

(b) Contents

(1) Type and Form of Radioactive Material

Revision 12 of this CoC contained 17 Types of contents. Revisions 13 and 14 have only 6 Types of contents.

Type 1 in this revision is equivalent to Type 7 in Revision 12. The plutonium in Type 1 contains at least 10% Pu-240.

Type 2 in this revision is equivalent to Type 12 in Revision 12.

Type 3 and Type 4 in this revision are variations on Type 13 from Revision 12. For Type 3 and Type 4, the pins or fuel pin assembly (cropped) are placed inside the 6CVL Independent Fuel Canister Containment Vessel Assembly described in Section 1.2.2.1 of the Addendum [See 5(e)].

Type 5 in this revision is equivalent to Type 2 in Revision 12. The plutonium in Type 5 contains at least 10% Pu-240.

Type 6 in this revision is equivalent to Type 11 in Revision 12.

(2) Maximum Quantity of Radioactive Material per Package

Irradiated, (a) mixed oxide (MOX) fuel pins and assemblies, (b) reactor fuel comprised of U-235 and/or Pu-239 oxides, carbides, nitrides, or metallic alloys, and (c) structural components. The minimum cooling time of each assembly and rod must be 90 days and the cask may contain 1,400 thermal watts. Prior to irradiation the fuel and structural components must have the following specifications:

Type		Fuel Description	Array Description	Maximum Fissile Package Loading	Pin Dimensions
1	40-pin MOX fuel pins	35% PuO_2-65% UO_2 (86% U-235)	Circular array; individual pins contained in 0.625" diameter tubes	9.6 kg	0.23" – 0.29" diameter, 36" active fuel length
2	24 max. pins U-Pu Carbide fuel pins	85-94% (Pu-U)C, 6 to 15% $(Pu\text{-}U_2)C_3$, Max 23% Pu, Uranium is not enriched	Circular array; individual pins contained in 0.625" diameter tubes within 5-inch Schedule 40 pipe	3.0 kg	0.37" outer diameter, 36" active fuel length
3	80 max. pins, Sodium bonded (fuel-to-clad)	10% Zr-20% Pu max. Remainder U (U enriched to 40% max. U-235)	Circular array; groups of pins in seven compartments inside a 5¼-inch outer diameter tube within a 6-inch Schedule 40 pipe.	7.5 kg	0.27" outer diameter, 36" active fuel length
4	169 Fuel Pin Assembly, Sodium bonded (fuel-to-clad)	10% Zr-20% Pu max. Remainder U (U enriched to 40% max. U-235)	Hexagonal array (w/pins at 0.32" center-to-center) within a 6-inch Schedule 40 pipe	15.8 kg	0.27" outer diameter, 36" active fuel length
5	217-pin MOX fuel pins	50% max $PuO+235UO_2$	Circular array; groups of pins in seven compartments in a 5-inch Schedule 5 pipe	27.5 kg	0.23" – 0.29" diameter, 36" active fuel length
6	Structural components (incl. Control assemblies)	Dosimetry foils	----	1.0 kg	----

(c) Criticality Safety Index Type 1, 2, 5, and 6 are supported by the SARP, which does not contain documentation to support calculated CSI values. Shipments for Type 1, 2, 5 and 6 will be made as exclusive use shipments with an assigned CSI=100. Type 3 and 4 contents are supported by the Addendum [See 5(e)] and the assigned CSI=0.

(d) Conditions:

(1) Shipments with this package shall comply with the requirements of 49 CFR 173.457.

(2) Type 1 and 2 contents must be housed within inner container Ident 1578 described by ERDA Drawing Nos. H-4-66160, Sheet 2, Rev. 0; and H-4-66230, Sheets 5 and 6, Rev. 0.

(3) Type 3 contents must confine loose fuel pins within a canister identified as the 6CVL Inner Pin Container Assembly (IPCA), described in Section 1.2.2.2 of the Addendum [See 5(e)]. The IPCA is placed inside the 6CVL Independent Fuel Canister Containment Vessel Assembly which is described by SRNL Drawing Nos. R-R1-A-00035, Rev. 3; R-R3-A-00028, Rev. 2; R-R4-A-00040, Rev. 3; R-R4-A-00041, Rev. 3; R-R4-A-00042, Rev. 1; and R-R4-A-00043, Rev. 2 of the Addendum and as described in Section 1.2.2.3 of the Addendum [See 5(e)]

(4) Type 4 contents consists of a single, cropped metal fuel assembly (housing 169 sodium-bonded metal fuel pins) placed inside the 6CVL Independent Fuel Canister Containment Vessel Assembly which is described by SRNL Drawing Nos. R-R1-A-00035, Rev. 3; R-R3-A-00028, Rev. 2; R-R4-A-00040, Rev. 3; R-R4-A-00041, Rev. 3; R-R4-A-00042, Rev. 1; and R-R4-A-00043, Rev. 2 of the Addendum and as described in Section 1.2.2.4 of the Addendum [See 5(e)].

(5) Type 5 contents must be housed within inner container Ident 69 described by ERDA Drawing Nos. H-4-66160, Sheet 1, Rev. 0; and H-4-66230, Sheets 5 and 6, Rev.0.

(6) Type 6 contents is a non-fuel payload (described in Section 1.2.3 of the SARP) such as a reflector assembly, non-fuel driver assembly parts or material samples containing dosimetry foils containing insignificant amounts of fissile material (less than 1 kilogram).

(7) The cask must be shipped dry. For Type 1, Type 2, and Type 5 contents, shipment of sodium wetted fuel rods (external) is authorized for up to 200 g of sodium provided the additional requirements of Section 7.4 of the SARP are adhered to.

(8) The cask must be shipped dry. For Type 3 and Type 4 contents, shipment of sodium wetted fuel rods (internal and external) is authorized for up to 1,525 g sodium (up to 4 g of sodium may be present as contamination on the exterior of the 6CVL) as described in Section 1.2.2.6 of the Addendum and following the procedures of Chapter 7 of the Addendum [See 5(e)].

(9) In addition to the requirements of Subpart G and 10 CFR Part 71: Each package must meet the Operating Procedures of Chapter 7 and the Acceptance Tests and Maintenance Program of Chapter 8 of the SARP. Type 1, Type 2, Type 5, and Type 6 contents must also meet the requirements of Chapter 7 and 8 of the SARP. Type 3 and Type 4 contents must meet the requirements of Chapter 7 Packaging Operations and Chapter 8 Acceptance Tests and Maintenance Program.of the Addendum [See 5(e)} The leak test to satisfy ANSI N14.5 and Regulatory Guide 7.4 must be a test having sufficient sensitivity to detect a leak rate (air at standard temperature and pressure leaking to 10^{-2} atm) of 10^{-7} atm cc/sec. The results of these tests must be documented and retained for the life of the cask. The visual inspections in Sections 7.1.2, 7.2.3, and 8.2.2 of the SARP shall include a visual inspection of the fire shield for indications of possible damage.

(10) Any repair to the trunnions because of out-of-roundness or weld failure must be authorized by DOE prior to returning the package to service.

(11) The containment closure bolts (as specified by Note 9, Drawing No. H-4-66230, Sheet 1) must be torqued to 70 +/- 10 ft-lb.

(12) Transport of fissile material by air is not authorized.

(e) Reference:

(1) *Consolidated Safety Analysis Report for T-3 Spent Fuel Shipping Cask*, WHC-1990, Revision 6a, Westinghouse Hanford Company, Richland, Washington, August, 1990.

(2) *Addendum to the Consolidated Safety Analysis Report for the T-3 Spent Fuel Shipping Cask Demonstrating Compliance to the Requirement of 10 CFR 71, Sodium-Bonded Fuel*, FFTF-30866, Revision 1, June 2007

Department of Energy
Washington, DC 20585

PACKAGE CERTIFICATION APPROVAL RECORD
Certificate of Compliance USA/9132/B(M)F (DOE), Revision 14
9132

Docket 09-06-9132

Revision 14 of Certificate of Compliance (CoC) USA/9132/B(M)F (DOE) for the T-3 is issued as a renewal with no change to contents or design. The ownership of the CoC is also changed from DOE Richland Operations Office to DOE Argonne Site Office. The expiration date for Revision 14 is December 31, 2013.

This certificate constitutes authority for the Department of Energy to use the T-3 for shipment of the authorized contents under 49 CFR 173.7(d).

Dae Y. Chung
Headquarters Certifying Official
Deputy Assistant Secretary
Safety Management and Operations
Office of Environmental Management

Date: 12/10/08

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